

Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 078 894 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
09.01.2002 Bulletin 2002/02

(51) Int Cl.7: **C03C 3/16**, C03C 3/19,
C03C 3/21

(43) Date of publication A2:
28.02.2001 Bulletin 2001/09

(21) Application number: 00306781.6

(22) Date of filing: 09.08.2000

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

- Tsuchiya, Koichi
Urawa-shi, Saitama-ken (JP)
- Nagahama, Shinobu
Urawa-shi, Saitama-ken (JP)

(30) Priority: 20.08.1999 JP 23398999

(71) Applicant: **SUMITA OPTICAL GLASS, INC.**
Urawa-shi, Saitama-ken (JP)

(74) Representative:
Baverstock, Michael George Douglas et al
BOULT WADE TENNANT, Verulam Gardens 70
Gray's Inn Road
London WC1X 8BT (GB)

(72) Inventors:
• Nakahata, Koji
Urawa-shi, Saitama-ken (JP)

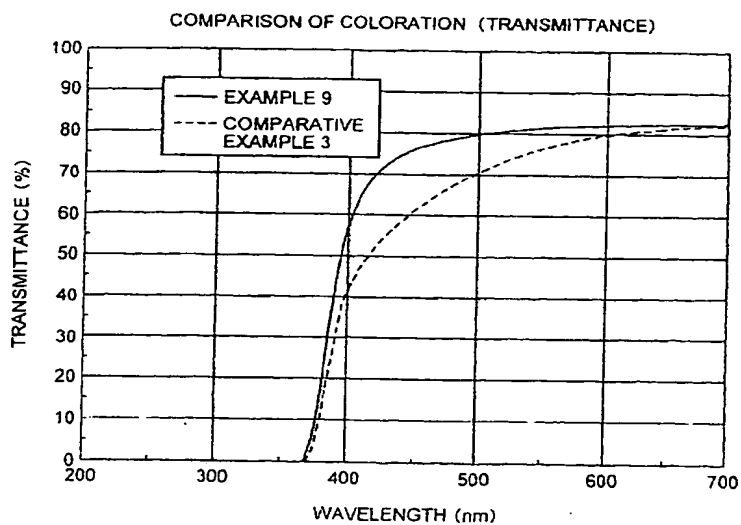
(54) **Optical glass for precision molding**

(57) An optical glass for precision molding, having excellent properties, i.e. yield temperature (At) of at most 550 °C, refractive index (nd) of at least 1.83 and Abbe number (vd) of at most 26.0 and further providing low softening as well as improved mass production capability with less coloration, which is represented, in term of atoms for making up the glass, by the following chemical composition (wt %):

P ₂ O ₅	14.0 to 31.0 %
B ₂ O ₃	0 to 5.0 %
GeO ₂	0 to 14.0 %
Sum of P ₂ O ₅ + B ₂ O ₃ + GeO ₂	14.0 to 35.0 %
Li ₂ O	0 to 6.0 %
Na ₂ O	2.5 to 14.0 %
Sum of Li ₂ O + Na ₂ O	2.5 to 15.0 %
Nb ₂ O ₅	22.0 to 50.0 %
WO ₃	0 to 30.0 %
Bi ₂ O ₃	5.0 to 36.0 %
BaO	0 to 22.0 %

EP 1 078 894 A3

FIG. 1





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 30 6781

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 4 996 173 A (TACHIWANA KAZUO) 26 February 1991 (1991-02-26) * claims; examples *	1-3	C03C3/16 C03C3/19 C03C3/21
A	JP 06 345481 A (OHARA INC) 20 December 1994 (1994-12-20) * abstract; examples *	1-3	
A	JP 08 104537 A (HOYA CORP) 23 April 1996 (1996-04-23) * abstract; examples *	1-3	
D, A	JP 10 316448 A (SUMITA KOGAKU GLASS:KK) 2 December 1998 (1998-12-02) * abstract; examples *	1-3	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			C03C
Place of search		Date of completion of the search	Examiner
THE HAGUE		20 November 2001	Van Bomme1, L
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EP 1 FORM 1403 01/02 (P)AL(01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 30 6781

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

20-11-2001

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 4996173	A	26-02-1991	JP	1219036 A	01-09-1989
			JP	1780311 C	13-08-1993
			JP	4071855 B	16-11-1992
			DE	3906280 A1	07-09-1989
JP 06345481	A	20-12-1994	JP	2747964 B2	06-05-1998
JP 08104537	A	23-04-1996	NONE		
JP 10316448	A	02-12-1998	NONE		

EPC FORM PUA98

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82